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FORM OUTPUT DEVICE

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FORM OUTPUT DEVICE

[Chohyo shutsuryoku sochi]

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[There are no amendments to this patent.]

Claim

A form output device characterized in that a form output device that outputs multiple hierarchical records into a details area of a form is equipped with

a hierarchy-identification means that identifies hierarchies of the aforementioned respective hierarchical records,

a holding means that holds pieces of output information concerning items to be output across records placed in hierarchies lower than a record in a prescribed hierarchy as it is identified by the aforementioned hierarchy-identification means, and

an output control means that outputs the pieces of output information held by the aforementioned holding means across the pieces of output information in the hierarchies lower than the aforementioned prescribed hierarchy.

Detailed explanation of the invention

[0001]

Technical field of the invention

The present invention pertains to a form output device that outputs data using a predefined format.

[0002]

Prior art

A conventional form output device is configured such that data records generated by a data processor are output, for example, printed as characters, in sequence according to pieces of format information predefined for the respective records.

[0003]

In such cases, output entries in the records are arranged in record-printing areas defined by the pieces of record-specific format information according to the pieces of format information defined for the respective entries.

[0004]

Problem to be solved by the invention

However, in the case of the form-output device of the prior art, because the respective records were arranged according to the pieces of form information defined for the respective records as described above, entries could not be output across multiple records.

[0005]

Therefore, binding output [literal translation] for enclosing lower hierarchies as evident in a business form could not be attained appropriately.

[0006]

The objective of the present invention is to realize binding output for enclosing lower hierarchies appropriately.

[0007]

Means to solve the problem

The present invention involves the following means. The form output device of the present invention outputs multiple hierarchical records into itemization areas of a form; wherein, a hierarchy-identification means identifies hierarchies of the aforementioned respective hierarchical records, a holding means holds pieces of output information concerning items to be output across records placed in hierarchies lower than a record in a prescribed hierarchy as identified by the aforementioned hierarchy-identification means, and an output control means outputs the pieces of output information held by the aforementioned holding means across the pieces of output information concerning the hierarchies lower than the aforementioned prescribed hierarchy.

[0008]

The means of the present invention functions in the following manner. When a record of a specific hierarchy is found within the hierarchies of the respective multiple hierarchical records, pieces of output information concerning entries found in said record that should be output across records placed in the hierarchies lower than that of said record are held. Then, the output control means outputs the pieces of output information held in the aforementioned holding means across the pieces of output information concerning the records in hierarchies lower than the aforementioned prescribed hierarchy. As such, pieces of output information concerning entries to be output across the records placed in the hierarchies lower than its own hierarchy are held, and areas where the entries are to be output are decided at a given point, for example, when a record in the same hierarchy has appeared, in order to arrange the entries across the records appropriately, so that the binding output for enclosing the lower hierarchies can be realized appropriately.

[0009]

Embodiment of the invention

An embodiment of the present invention will be explained below with reference to Figures 1-4.

[0010]

Figure 1 is a diagram showing its configuration. In said figure, reference number 10 represents a CPU that controls the entire [device]. 12 represents an input part for entering data, and 14 represents a record file for storing entered data as records. 16 represents a print-format memory for storing for print formats the data records, and 18 represents a working memory

which is used as a work area for CPU 10. In addition, 20, 22, and 24 represent y register, y_1 register, and y_2 register which are used during form output processing, to be described later. Similarly, 26 represents a key entry data register. Then 28 represents an output memory where output data are unfolded during the form-output processing, to be described later, and 30 represents an output part, such as a printer, which is used to output the output data stored in output memory 28.

[0011]

Here, as shown on the right-hand side of Figure 2, aforementioned record file 14 includes hierarchy data that indicate to which of the multiple hierarchies (The present embodiment involves two hierarchies, namely, hierarchy 1 and hierarchy 2, for the simplification of the explanation) a given record corresponds, key entry data indicating the contents of the entries, and multiple records that contain entry data as the actual data (quantitative values, in the present embodiment), which are divided using commas. Furthermore, the present embodiment assumes that hierarchy 2 is higher than hierarchy 1.

[0012]

In addition, as shown in Figure 3, aforementioned printing format memory 16 has a memory structure in which the key entries (hierarchy 2, hierarchy 1) and only x coordinates, which indicate the positions where the entries are output, are stipulated.

[0013]

Next, form output operations to be carried out under said configuration will be explained with reference to an actual output example and a drawing showing its relationship with the originating data record in Figure 2 and the flowchart in Figure 4.

[0014]

That is, first, y register 20 is set to "1" in order to set initially output y coordinate to "1" (Step S1).

[0015]

Then, after the next record is read from record file 14 (Step S2), whether a previous record is present is determined (Step S3). If there is no previous record, a jump is made to Step S10, to be described later. However, in this case, because the 1st record "2, Home appliance division, 600" is read, a determination is made automatically that there is no previous record as a matter of course. Next, the entry data ("600") other than the key entry of the current record is

written to output memory 28 according to the y coordinate ("1") indicated by the value set in y register 20 and the x coordinate "x₂") defined in printing format memory 16 in order to output it from output part 30 in the form of characters, for example (Step S4). Furthermore, although output is made in sequence in the present embodiment, it may be output after data equivalent to one page or all data are written to output memory 28 as a matter of course.

[0016]

Next, whether the hierarchy of the current record is of the higher hierarchy, that is, hierarchy 2, is determined (Step S5). A jump is made to Step S8 if it is not. However, in this case, because the hierarchy of the 1st record is "2," the key entry data of said 1st record, that is, "Home appliance division," is then stored into key entry data register 26 (Step S6). Then, whether this is the next record or not is determined (Step S8) with reference to register code file 14 after the content of y register 20 is copied to y₁ register 22 (Step S7). A jump is made to Step S18, to be described later, if there is no such record. However, in this case, because the 2nd record and records thereafter are still present, [the process] returns to aforementioned Step S2 after "+1" has been added to the value in y register 20 (Step S9).

[0017]

Then, upon reading the next record, that is, the 2nd record, from record file 14 in aforementioned Step S2, whether there is a previous record or not is then determined in aforementioned Step S3. As such, in this case, the hierarchy of the current record and the hierarchy of the previous record are compared with reference to record file 14 (Step S10) in order to check the result (Step S11). In this case, because the hierarchy of the current record is "1," and the hierarchy of the previous record is "2," a judgment is made that the hierarchy of the current record is lower. Next, the entry data ("100") other than the key entry of the current record is written into output memory 28 according to the y coordinate ("2") indicated by the value set in y register 20 and the x coordinate ("x₂") defined in printing format memory 16 in order to output it from output part 30 (Step S12).

[0018]

Subsequently, upon returning to Step S8, because the next file still remains in record file 14, the next record, that is, the 3rd record, is read in Step S2 after "+1" is added to the value of y register 20 in Step S9. Then, because a judgment is made that there is a previous record in Step S3, the hierarchy of the current record and the hierarchy of the previous record are compared in Step S10, and the result is checked in Step S11.

[0019]

Because the hierarchy of the current record and the hierarchy of the previous record are both "1" this time, the key entry data ("television," in this case) of the previous record is written into output memory 28 according to the y coordinate (in this case, $3 - 1 = 2$) indicated by the value obtained by subtracting "1" from the y value set in register 20 and the x coordinate (" x_1 ") defined in printing format memory 16 with reference to record file 14 in order to output it from output part 30 (Step S13). Subsequently, upon advancing to aforementioned Step S12, the entry data ("200") other than the key entry of the current record is written to output memory 28 according to the y coordinate ("3") indicated by the value set in y register 20 and the x coordinate (" x_2 ") defined in printing format memory 16 in order to output it from output part 30 before returning to aforementioned Step S8 again.

[0020]

The next record, that is, the 4th record, is processed in the same manner.

[0021]

To the contrary, as for the following record, that is, the 5th record, a judgment is made that the hierarchy of the current record is higher than the hierarchy of the previous record in Step S11. As such, in this case, the key entry ("Telephone," in this case) is written to output memory 28 according to the y coordinate (" $5 - 1 = 4$," in this case) indicated by the value obtained by subtracting "1" from the value set in y register 20 and the x coordinate (" x_1 ") defined in printing format memory 16 with reference to record file 14 after the value obtained by subtracting "1" from the value set in y register 20 is set at y_2 register 24 (Step S14) in order to output it from output part 30 (Step S15). Furthermore, the key entry data, that is, Home appliance, in this case, is written into the area of output memory 28 which is given by the y coordinates in the range extending from the y coordinate indicated by the value ("1") set in y_1 register 22 to the y coordinate indicated by the value ("4") set in y_2 register 24 and the x coordinate (" x_1 ") defined in printing format memory 16 in order to output it from output part 30 (Step S16). Then, [the process] returns to aforementioned Step S4 after the key entry data held in key entry data register 26 is erased (Step S17).

[0022]

The same processing as that described above is carried out thereafter.

[0023]

Then, upon returning to Step S8 after the entry data "500" is output in Step S12 with respect to the 10th record, a judgment is then made that no more records are present. In this case, the key entry data "FAX" in the current record is written into output memory 28 according to the y coordinate ("10") indicated by the value set in y register 20 and the x coordinate ("x₁") defined in printing format memory 16 in order to output it from output part 30 (Step S18). Then, whether any key entry data is held in key entry register 26 is determined (Step S19), and the processing ends immediately if not. If there is any, however, the key entry data, that is, "Information equipment division," in this case, which is held in key entry data register 26 is written into output memory 28 in order to output it from output part 30 (Step S20) before ending the processing.

[0024]

As described above, because the pieces of output information, that is, key entries, on the entries to be output across the records in the hierarchies lower than that of its own record are held, and the output areas where the entries are to be output are decided when a record with the same hierarchy has appeared, the entries can be arranged appropriately in the areas across the records which change based on the number of the records involved.

[0025]

Furthermore, although an example involving two record hierarchies was explained in the aforementioned embodiment, the present invention can be applied to more hierarchies easily by extending the aforementioned idea as a matter of course.

[0026]

In addition, although the key entry of the previous record is output with reference to record file 14 in aforementioned Steps S13 and S15, it may also be held, just like the key entry data of the higher hierarchy.

[0027]

Effect of the invention

According to the present invention, because the pieces of output information concerning the entries to be output across the records in the hierarchies lower than that of the own record are held, and the output areas where the entries are to be output are decided when a record with the same hierarchy has appeared, the entries can be arranged appropriately in the areas across the records which change based on the number of the records involved. As a result, binding output for enclosing lower hierarchies can be realized appropriately.

Brief description of the figures

Figure 1 is a block diagram of the form output device of an embodiment.

Figure 2 are an example of the actual form output and a drawing showing its relationship with the originating data record.

Figure 3 is a diagram showing form information stored in a printing format memory.

Figure 4 is a flow chart for explaining operations of an embodiment.

Explanation of symbols

10 ... CPU; 12 ... input part; 14 ... record file; 16 ... printing format memory; 18 ... work memory; 20 ... y register; 22 ... y_1 register; 24 ... y_2 register; 26 ... key entry data register; 28 ... output memory; and 30 ... output part.

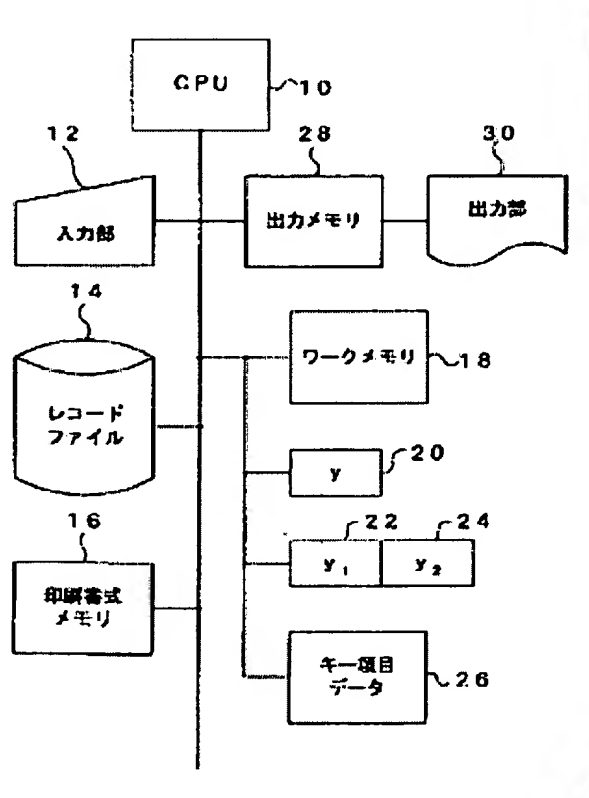


Figure 1

Keys: 12	input part
14	record file
16	printing format memory
18	working memory
26	key entry data register
28	output memory

30 output part

家	600	2. 家庭部門, 600
電 テレビ	100	1. テレビ, 100
部 ラジオ	200	1. ラジオ, 200
門 電話	300	1. 電話, 300
情	1500	2. 情報機器部門, 1500
機 パソコン	100	1. パソコン, 100
機 オフコン	200	1. オフコン, 200
器 ハンディターミナル	300	1. ハンディターミナル, 300
器 イメージャー	400	1. イメージャー, 400
機 FAX	500	1. FAX, 500

Figure 2

- Keys: a Home appliance division
 b Information equipment division
 c Television
 Radio
 Telephone
 d Personal computer
 Office computer
 Handy terminal
 Image reader
 e Hierarchy, Key entry, Entry

キー項目	項目
階層2	x_1
階層1	x_1'
	x_2

Figure 3

- Keys: 1 Key entry
 2 Hierarchy
 3 Entry

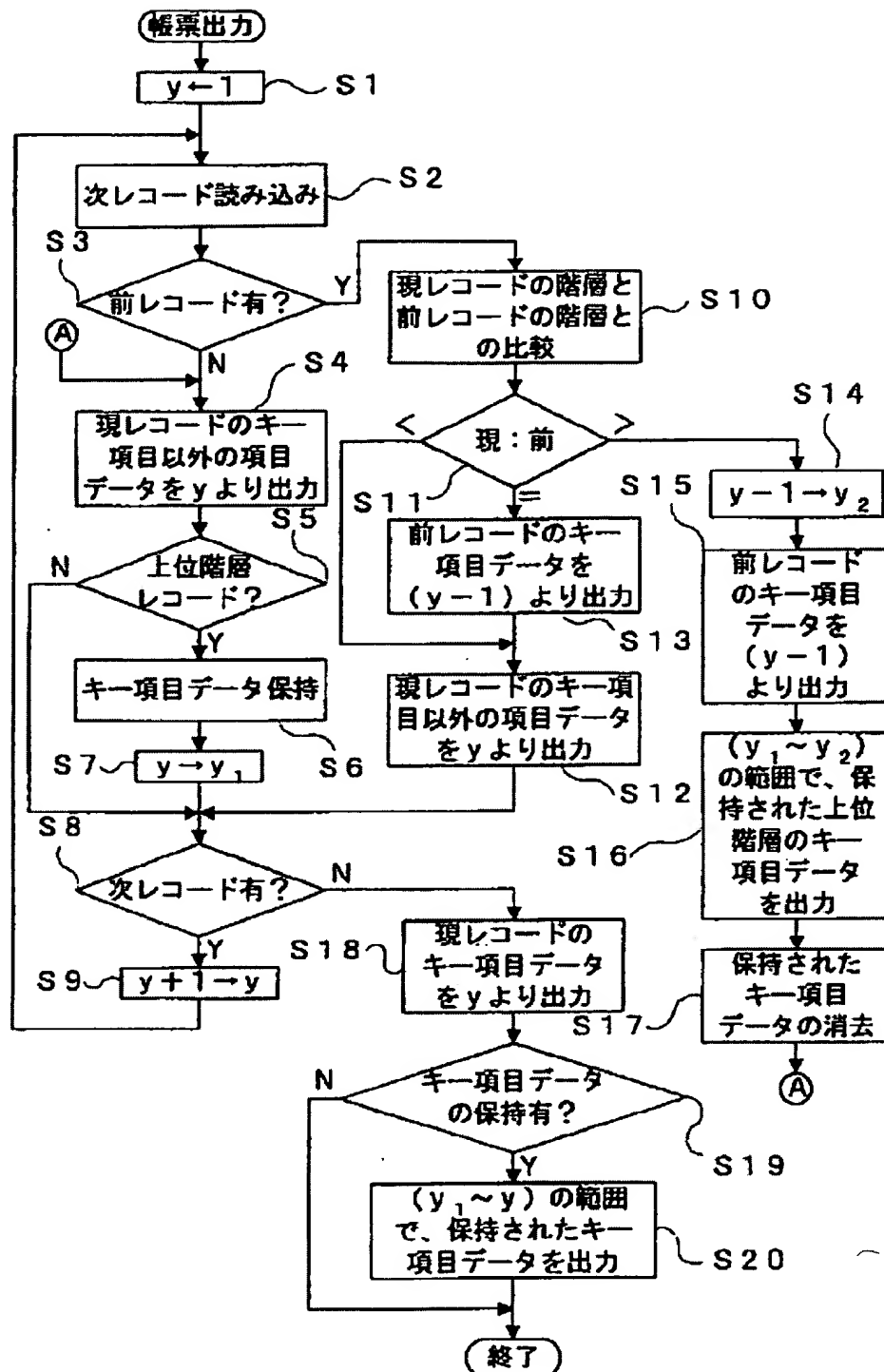


Figure 4

- Keys: a Form output
 b End
 S2 Read the next record
 S3 Is there a previous record?
 S4 Output the entry other than the key entry in the current record from y

- S5 Higher hierarchy record?
- S6 Hold the key entry data
- S8 Is the next record present?
- S10 Compare the hierarchy of the current record with the hierarchy of the previous record
- S11 Current : Previous
- S12 Output data concerning the entry other than the key entry in the current record from y
- S13 Output the key entry data in the previous record from $(y - 1)$
- S15 Output the key entry data in the previous record from $(y - 1)$
- S16 Output the key entry data of the higher hierarchy held in the range of $(y_1$ through $y_2)$
- S17 Delete the key entry held
- S18 Output the key entry data in the current record
- S19 Any key entry data held?
- S20 Output the key entry data held in the range of $(y_1$ through y)